DATA PROCESSING DIGEST

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General Information

AMERICAN MANAGEMENT ASSOCIATION, 1955

"The Impact of Computers on Office Management" *Office Management Series Pamphlet No. 136*

"Will Electronics Make People Obsolete?"

by J. Douglass Elliott, The Detroit Edison Company.

Four basic fears or misconceptions regarding electronic systems are analyzed: 1) These electronic brains will become the masters of men; 2) only a few highly skilled specialists will be needed to set up and operate the machines; 3) the few workers who are still needed will lose their individuality and will have simple, routine jobs; 4) wholesale layoffs will result when the machines are installed.

Regarding the first fear, it is pointed out that the machines are complete morons, and must be told every move to make. In a recent advertisement of a large electrical manufacturer, the question was asked: "Can they (electronic machines) outsmart men?" The answer was: "The reassuring fact is just the opposite; they make men even smarter by taking over routine mental chores and freeing men for the creative thinking only human minds can encompass."

Regarding the second fear, it is pointed out that programming the computer is a process of writing operating procedures. It is logical to expect a company to use its own methods men, supervisors, and other staff people, who are familiar with the routines and company policies, for preparing such machine programs, after giving them a few weeks of detailed training on programming. At the same time, programming specialists can be valuable for working out short cuts in the programming operations. Also, there is little need for an electronics engineer in a business installation, providing the servicing of the machines is done by the manufacturer.

Concerning the loss of individuality, it is felt that employees will feel more, not less, important through the use of this equipment by reducing the number of simple repetitive tasks and the creation of new jobs requiring varied and responsible duties.

The fear of wholesale layoffs is not as easily dispelled as the other factors discussed. The question is analyzed in terms of 1) the people who will tell the machines what to do, 2) the people who will feed information into the machines, 3) the people who will operate the machines, and 4) the people who will interpret the results produced. It is in the area of operation, or of data processing, that the displacement will be greatest. However, only a portion of the total white-collar labor force is presently engaged in this phase, so that the reduction will not appear so great when compared with the total workforce.

In addition to dispelling the fears and clearing up the misconceptions among employees, there are also the problems of warding off resistance and resentment to job changes, and placing the surplus employee and selecting and training employees for new jobs.

OFFICE MANAGEMENT, *January, 1955; Pages 38-40, 65-68*

"Automation in the Office," *by Robert M. Smith.*

Most significant development of 1954's office management field was rapid emergence of actual working concepts of the automatic office. Data processing systems using common language tape are in operation, and manufacturers are beginning to develop machines which make use of the system.

Burroughs' idea is to try to streamline the operations in each area, using the best machines and techniques for the problem at hand. When each area is brought up to its top efficiency, it is linked with the other areas to give a packaged integrated data processing system. To cut down on time and labor in initial preparation of data, Burroughs has developed an accounting machine which produces a punched paper tape as a by-product, and also a unit which reads numbers from a printed card or check or other document and punches a card to correspond. The unit can read printed data and punch at the rate of 7200 cards per hour.

In the "data manipulation" area Burroughs is developing a small computer at $30,000 for the average smaller business. In the "document production" area, Burroughs has developed a high speed printing and accounting machine, which prints and punches a card in a single operation.

The significance of rapid development of the automation concept in American business is in the new possibilities of scientific management decision about future sales, business trends, regional markets, as well as basic research and production problems.

AMERICAN BUSINESS, *March, 1955; Pages 16-18, 38-39.*

"Electronic Data Processing – who, what, when and where?" *by Herbert O. Brayer.*

In the second of a series (see April DPD, page 3), six points are suggested for consideration by organizations planning to investigate the use of automatic data processing systems.

1. Studying and reorganizing present systems can result in savings before a computer is installed.
2. Competition demands that all organizations, large and small, study the possibility of using electronic data processing methods.
3. Savings in both time and personnel have been realized.*
4. Many companies are integrating electronic equipment with present mechanical equipment.
5. New equipment is available for medium and small businesses.
6. Surveys show that employees eliminated by electronic data processing will be placed in other less routine jobs.

*One 2-million member book club installed data processing equipment a year ago, has effected savings of more than 10,000 man-hours a month. Lockheed realized a 40% saving in cost of preparing a production schedule, as well as great reductions in time. John Hancock Mutual Life Insurance Company reduced accounting procedure steps by over 80%. Other examples are listed in the article. A survey among 100 companies daily using electronic equipment in integrated data processing systems, provided additional statistics on savings and efficiency which are listed in the article.

HARVARD BUSINESS REVIEW, *March-April, 1955; Pages 120-128.*

"Electronic Computers: a progress report," *by Peter B. Laubach and Lawrence E. Thompson.*

A review was made of the electronic computing field, with information drawn from 12 manufacturers of electronic computers and 26 companies who either have or will soon have computers.

Six conclusions were drawn from their study:

1) From two to five years are needed from the time a company begins to investigate the field until it can realize savings from an installation. Investigation, selection, programming, installation, and debugging are the usual steps in acquiring and making ready a computing system.

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2) However, the period of investigation also can be of value in clarifying and improving prevailing systems, even if the end decision is to not go into an electronic system.

3) The process of surveying the needs and the available equipment is best done by the company's own personnel, since such work will give them a great deal of valuable experience for use when the system has been selected.

4) While selection of mechanical methods as a gradual step toward installing electronic methods is not necessary, consideration of mechanical methods should be made along with electronic, and selection made on comparative analysis of the two.

5) Adequate pre-planning of the company's requirements made during selection of general purpose equipment will eliminate later expensive custom additions to fill in the blank spaces.

6) Companies should be realistic about the limitations of electronic equipment, at the same time being aware of their possibilities in helping to make management decision.

While a superficial knowledge of the field can be obtained through reading literature as it is available, only a painstaking survey and study of the field can produce the sound decisions necessary for an efficient data processing installation for a particular company. Since this requires much time, such studies should be undertaken at once.

RESEARCH FOR INDUSTRY, *November, 1953*

News Bulletin from Stanford Research Institute.

"Techno-economics research points the way to electronic data processing."

There is a constantly growing volume of clerical work which is being slowed down for want of enough time and personnel to handle it. The result is that management does not have information to make adequate decisions. Automatic data processing is gradually taking on the responsibility for remedying the situation.

SYSTEMS AND PROCEDURES QUARTERLY,

November, 1954; Pages 7-11.

"Electronic business machines – today – tomorrow."

Data processing in business operations requires a variety of input and output equipment which is not yet available, if economical use is to be made of an electronic computer. Burroughs advocates using the best of the electro-mechanical equipment now rather than waiting for a large complete system.

RAILWAY AGE, *January, 1955; Pages 138-139*

"Computers to control operations.

Railroads are becoming interested in electronic computers for several uses: as automatic controls in the freight yards and for automation of clerical work in the offices. C&O, UP, Great Northern, Southern, all have computers operating or on order. Results indicate that computers will provide management with significant and timely figures at hand to assist them in making decisions and supervising operations.

IRE TRANSACTIONS, *March, 1955; Pages 33-38.*

"Review of electronic computer progress during 1954."

A brief review of the highlights of the year in equipment and applications, with references to significant publications appearing in the past 15 months.

AUTOMATION, *April, 1955; Pages 104-106.*

"People are needed in data processing."

Electronic computers are available to solve the increasingly complex problems of business, but there is a need for systems personnel who apply the basic principles of automatic data processing to the problems of a specific business operation.

BANKING, *April, 1955; Pages 41, 134.*

"Electronics in Savings operations."

Electronics in bank operations is a reality and both large and small banks can take advantage of available equipment, although uniformity of operations is a necessity.

BUSINESS WEEK, *April 16, 1955; Page 118.*

"Brokers turn to automation."

Brokerage houses are following insurance companies and banks in using electronic computing devices for accounting and other data processing uses.

OFFICE MANAGEMENT, *April, 1955;*

Pages 18-21, 34, 65, 66.

"Decentralized management not threatened by data processors, AMA told."

Report of the AMA Finance Division conference on electronics held in New York, February 28 – March 2. Includes a review of C&O's planning and selection of a computer system as described by C&O executives at the conference.

NEW BOOK – "Arithmetic Operations in Digital Computers," *by R. K. Richards. – (Van Nostrand, 1955)*

A complete description of the logical organization of present-day general purpose computers is given in this book. The discussion starts with the symbolic approach to logical design; continues with the logical design of elements to perform basic functions – addition, multiplication, number system conversion, etc. – in both binary and decimal number systems. The final chapters are devoted to the logical organization of a computer as a whole, and to programming techniques. Programming is based on a hypothetical but typical machine.

The logical design is treated without reference to the electronics involved and should be understandable to those with no electronics background; only a knowledge of algebra and an open mind about number systems and logical processes is required.

This book should be good background material for programmers and other computer-users who want to know a little about what goes on inside the computer. The book also contains a treatment of some error detecting and correcting methods which apply within computers and also to the external transmission of data.

Applications

AMERICAN MANAGEMENT ASSOCIATION, 1955
"The Impact of Computers on Office Management" *Office Management Series Pamphlet No. 136.*

"Computer Methods and Applications: A Case Study," *by Emerson F. Cooley, Prudential Insurance Company of America*

Prudential began investigating the possibilities of electronic computers for insurance applications in 1946. By 1952, several machines had been considered and rejected, on the basis of insufficient savings over the present punched card methods. However, studies of the IBM Tape Processing Machine (ed. note: later revised to the IBM 702) indicated possibilities of sufficient savings to warrant further study. In order to make an evaluation, procedures on the premium billing and accounting operations were redrafted by two men.

The area which Prudential has decided to mechanize is already mechanized to a high degree. They are investigating, but not yet planning to use the computer for 1) the mechanization of clerical tasks that have not been mechanized before due to complexity or prevalence of exceptions, or 2) carrying out extensive calculations to give better guides for managing the business.

The premium billing and accounting operation being planned covers 3 million policies in the Newark office, averaging 200 characters per policy, and requiring some 200 reels of magnetic tape. To run the whole file weekly would require some 80 hours. To reduce this time, the file is arranged primarily by premium due date, grouped by weeks (e.g. all premiums due the first week of any month are grouped together), and within that breakdown the policies are arranged by agency number, and within agencies by policy number. Thus, only one quarter of the whole file need be processed each week. To find the record on a given policy, it is necessary to know the due date, agency, and policy number.

While the system makes use of magnetic tapes for basic records, it does not eliminate punched cards. All changes will be introduced by punched cards, usually read directly into the computer. Premium notices will be converted from tape to cards and the cards mailed to the agencies. The premium cards will be merged with name and address cards, and the notices printed on punched card accounting machines. Tape-controlled printers have not yet appeared as economical as punched card printers, in the Prudential study.

One value of the electronic system will be to reduce the "exposure to change." Under the present system, premium notice writing is spread over one month and notices must be ready for mailing 20 days before the earliest due date. Premiums due as late as October 28 can be written as early as August 10. Under the electronic system, this spread should be reduced, hence reducing the number of changes made to notices which have been written but not mailed.

Magnetic tape files will not be the only record; a historical record, showing everything except data on premium payments, will be maintained in the home office. Premium payment records will be maintained in agency offices. For case work—surrenders, claims, loans, and changes—reference will be made to the historical record, not the tape.

AMA CONFERENCE REPORT, *February, 1955. The Chesapeake and Ohio Railway Company*

Part I – "Making a feasibility study"

The C&O established a Methods Research group in 1952 for the purpose of studying new information recording, and processing tools and techniques. The group found that improvement of communications in its widely separated operations was a matter of company-wide interdepartmental integration. This resulted in a company-wide integrated information recording and processing system which they named "a one-shot process." The emphasis is on processing whole families of related data. The potential computer applications were divided into four "solar systems," around which were clustered the "planets" of the associated areas which were the sources of information to be processed. Information lines were simplified to eliminate parallel and duplicated efforts. Informational needs were recognized as company-wide not merely as needs of a series of departments.

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Part II – "Communication as an Element in an Integrated Information Handling System."

The communication system was built around the Freight Waybill since this document is the most widely applicable in a railroad organization.

Several dozen major terminal and yard offices are equipped with teletypewriter equipment. As a freight car and waybill are made up at one of these points, the details of the waybill are prepared on the teletypewriter keyboard, producing a typed record and a punched tape. The tape is filed with its waybill. This transaction is on a "room circuit" (local only). When a train is made up, the tapes and waybills are similarly grouped into a "train consist." The waybills are given to the conductor. The tapes are used to transmit a description of the train to the next yard office, so its work can be planned in advance. As it gets a typewritten copy of this transmitted information it also gets a punched tape. This tape is used in preparing this yard's new report for the next yard, and so forth.

As a train consist is being transmitted to the next terminal it is simultaneously being transmitted for other uses to traffic offices, and superintendent of Freight Transportation. Later, these same tapes can be mailed or wired to different offices for records accounting, revenue accounting, or inputs to electronic computer for solving a variety of problems.

It was necessary to limit the information to be transmitted to that portion most universally needed, and then to standardize abbreviations and symbols, and prepare a form consistent with teletype spacing.

A training group composed of men with good personalities and plenty of yard experience was given the job of training the yard men in the idea of the program and the operation of the machines.

The gains from the program fall into three areas: current and advance information in yard operation; timely information in traffic and sales departments; and immediately available and accurate summations on which managerial judgement can be based. Ultimate objective of waybill procedure: provision of information for use as a major input for the computer. One expected use for the computer: speedy forecasting of traffic requirements.

Already short range or immediate savings have been recognized in the yard offices, and in detection and correction of open and misroutes.

N.A.C.A. BULLETIN, *February, 1955; Pages 798-804.*

"Distribution of Overhead with Electronic Computers," *by Harry T. Ashman, Eli Lilly and Co.*

The most accurate distribution of overhead among departments of cost centers is by the use of simultaneous linear equations, the solution of which is tedious and time consuming.

Eli Lilly and Company uses the IBM 604 Electronic Computer to solve the linear equations, and has reduced the time for computing monthly overhead distribution from over forty hours to less than two. The procedure is: 1) a file contains a detail card for each interdepartmental distribution; 2) another file contains a master card for each department in the chart of accounts; 3) only service department cards are used in initial calculation; 4) non-service cards are included in final calculation; 5) resulting information is used to prepare journal vouchers to make inter-department overhead cost transfers.

Advantages of the system are: accuracy, earlier availability of information, simplified voucher preparation and posting, realistic cost comparisons.

AMERICAN BUSINESS, *December, 1954; Pages 12, 41-44*

"Electronic brain keeps tab on 11,500 Rexall Stores."

The Rexall UNIVAC punched-card computer showed it was paying its own way in less than 60 days on routine accounting procedures. Following the establishment of these uses, Rexall management began experimenting with analysis of marketing operations. The computer was used to plan the allocation of salesmen, outlets and advertising in proportion to current business opportunities. The computer was used also for studies of activity during Rexall 1-cent sales. This was done by setting up automatic percentage comparison between sales activities in drug stores in each of 3000 counties in U.S., and national "standards," which were set up as constants. For sub-standard stores, goals were computed to bring them up to average. Information for the "standard" was derived from a random selection of stores questioned after the spring, 1954 sale. Rexall hopes to extend this technique to its entire line of products.

SYSTEMS AND PROCEDURES QUARTERLY, *November, 1954; Pages 12-16.* **"Electronic data processing."**

Following a study begun in 1949, New York's Port of Authority is reorganizing to use a completely integrated electronic system to handle tolls recording and accounting at their six vehicular crossings.

AMERICAN BUSINESS, *March, 1955; Pages 12, 13, 38*

"Work simplification by-products pay off big at Acme."

Use of common language tape in processing customer orders produces master factory order giving all specifications, raw material required, and instructions to each department involved.

AVIATION WEEK, *March 28; Pages 36, 37.*

Convair will feed engineering data into a computer which in turn will control a milling machine.

THE CONTROLLER, *March, 1955; Page 148.*

"This electronic world."

The Philadelphia office of the Pennsylvania Railroad uses Western Union facsimile equipment for speeding up over-the-counter ticket sales, reservations and inquiries.

RAILWAY AGE, *March, 1955; Page 5.*

The New Haven Railroad has ordered a computer to process 7500 freight waybills and 8,000 – 10,000 car movements daily.

Equipment

BEST'S INSURANCE NEWS *(Life edition), January, 1955; Pages 45-50*

"Character Sensing," *by Clyde C. Heasly, Jr., Intelligent Machines Research Corp.*

The "analyzing reader" is a name given to any machine which operates by "character sensing." A detailed description is given of a reader using the Intelligent Machines Research "character sensing" techniques, in which the reader identifies the character by scanning and interpreting the combination of strokes. It then sends out a signal which is unique for that character, and the signal is stored until called for by the output device. The output device can be a card punch, tape perforator, or magnetic tape recorder; or the output signal may be sent back to cause the reader to sort in accordance with the information on the document being read.

The reader can read as many as 200 or 300 characters per second, but its speed is kept under 100 because of the slower speeds of available output devices. Accuracy is kept high by the automatic rejection of documents on which the information is blurred or defaced so that reading becomes difficult. Although extra intelligence could be added to the machine to overcome these difficulties, the cost would be out of proportion to the benefits. The reader described is slightly larger than a key punch machine.

An analyzing reader is being used in a travelers check reconciliation problem, and experiments are being made to overcome difficulties of random check design and other surface interferences in the sensing operation.

Other experimental equipment includes a random size check sorter and a mail sorter.

SYSTEMS, *January–February, 1955; Pages 3-5.*

"The UNIVAC File-Computer."

The UNIVAC File Computer provides fast random access to data filed in magnetic drums. Unsorted data can be processed in a single program. Input media: paper or magnetic tape, 80- or 90-column punched cards, 10-key devices or typewriters. Several unrelated types of transactions may be processed simultaneously. Up to 100,000 unsorted items can be entered in their separate accounts as they arrive, in one 8-hour day.

BUSINESS WEEK, *March 12, 1955; Pages 62-64.*

"Electronic bookkeeping."

Farrington Mfg. Co.'s Scandex system extends the Charga-Plate credit identification method through the entire bookkeeping operation from point of sale to processing of invoices.

COMPUTERS AND AUTOMATION, *April, 1955; Pages 10-14.*

"Marginal Checking"

An effective computer preventive maintenance technique is marginal checking, i.e., checking for circuits near the failure point by applying abnormal environments.

THE OFFICE, *April, 1955; Page 122.*

"Printer for computer."

Burrough's Electrographic Recording can print 5000 characters per second from electronic computer or other data processing equipment.

Management Decision

ADVANCED MANAGEMENT, *March, 1955; Pages 21-28.*

"Production scheduling: an operations research case study."

A research team from the Case Institute of Technology made an extensive operations research study at the Warner-Swasey Company with the full cooperation of top management. The operations research team first familiarized itself with the company operations; determining their nature and how they are controlled. For the latter they considered the company as a communications circuit. They covered sales and production with associated cost analysis.

An analysis was made of the production planning; that is, determining the requirements for parts based on requirements for final assemblies. During this analysis it was recognized that inventory levels affected all departments.

The existing policy for establishing inventories was to carry the minimum number of parts necessary to maintain present levels of shipments. The operations research team developed another method which should result in a net saving. It was developed by first defining the variables such as: set-up costs, planning costs, planning periods, lot size. (This process showed up a need for performing cost accounting to obtain control data rather than historical information only.) They then derived the cost of carrying inventory (in this case about 1% per month per dollar invested). The number of lots to be run per planning period could then be set so as to yield varying production costs.

An equation relating production cost to the number of lots per period was developed and the cost minimized. This gave a formula for optimum lot size as a function of basic costs and schedule requirements. This formula was applied to historical information and indicated for one group of parts that doubling the inventory would have resulted in substantial savings. In another case a net reduction in production costs of 3.5% was estimated.

In implementing the formula other difficulties arose which were solved by further operations research:

The additional capital required was estimated. Although small raw material cost savings were found, significant freight savings would result from use of the formula.

Bottlenecks in production would develop (because of long runs). Further work using "waiting-line theory" helped analyze this problem. The value of new production facilities was estimated. A gradual change-over to the use of the new inventory policy was adopted (3 year period).

The additional storage space required under the new policy was made available by a revision of the repair order processing.

The mathematics involved in this optimum lot scheduling technique could be handled easily on automatic equipment being installed for scheduling.

An investigation showed that short range variations would not upset the method.

To help schedule under a varying sales demand, a sales demand predictor was developed based on extension of the current trend for a year and then detection of changes in actual trend from this prediction by a method similar to that used in quality control charts.

Conversion to the new technique for determining economic lot size is now in process. The case indicates the breadth of scope and dynamic nature of operations research.

MANAGEMENT SCIENCE, *January, 1955; Pages 138-151.*

"Optimal Estimation of Executive Compensation by Linear Programming," *by A. Charnes and W. W. Cooper, Carnegie Institute of Technology, and R. O. Ferguson, Methods Engineering Council.*

This paper points out that certain problems concerned with determining sales quotas, with break-even analysis, and with executive compensation can be expressed in terms of linear programming. These problems can be thought of as trying to relate a certain desired result (as salary) to factors which can be measured (such as initiative, experience) subject to policy restrictions (as, salaries must meet market

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levels). If we can assume that the relationships are linear and that the policy restrictions can be thought of as fixed levels or boundaries, then linear programming techniques can be applied.

The body of the paper is devoted to a detailed description of the application of such a formulation to the determination of a linear formula for executive compensation. The formula developed gives the salary attached to a given position as a function of various factors ("initiative," "experience," etc.). The formula must not violate the company position heirarchy, must place the compensation for each job between certain limits, and must not attach a negative value to any factor. Finally, it is desired that certain salaries meet given levels as closely as possible. Numerical values for the formulas are determined from an analysis of existing personnel. The paper describes in detail how such a problem is set up, and gives a small numerical example. ((A mathematical presentation.))

MANAGEMENT SCIENCE, *January, 1955; Pages 152-166.*

"Mathematical Programming of Portfolio Selections," *by A. D. Martin, Jr., Carnegie Institute of Technology.*

A method is presented whereby an investor can choose an investment portfolio from a given list of securities in such a way as to maximize the rate-of-return for a given degree of risk; or, alternatively, he may minimize the risk involved in obtaining a given rate-of-return. The method, based on the work of Harry Markowitz, provides a reasonable substitute for standard theories of portfolio selection, which do not satisfactorily account for the desirability of diversification.

The method requires estimates of the expected rates-of-return for the securities under consideration, and also for the variances (a measure of the degree-of-risk) and co-variances (measure of the tendency of pairs of securities to vary together) of these rates-of-return. The author remarks that the variances and co-variances are not ordinarily known (except, perhaps, to some large institutional investors), but indicates how they can be estimated on the basis of the past performance of the securities.

An illustrative example involving four securities is given, and the problem of selecting a minimum-risk portfolio is solved, for various required rates-of-return.

((In larger realistic examples, more complicated methods are needed than this example indicates; when many securities are to be considered, electronic computation will be necessary. However, there is reason to believe that the method developed will be of practical importance, at least to large institutional investors. This is a mathematical presentation.))

MANAGEMENT SCIENCE, *January, 1955; Pages 103-114*

"Computing in Management Science," *by Cuthbert C. Hurd, IBM Corporation.*

Management science and the development of the electronic computer have influenced each other with two results: Forward-looking executives believe that faster reports will lead to better management; management science is making use of mathematics and logic to aid in scientific decision-making.

Scientific methods can be applied to business through the use of linear equations and linear programming, and simulation. These techniques can be used only if a system can be described numerically, and if data is available from which to select the variables and parameters to be used in the equations.

((This is a technical article, written for persons acquainted with the techniques described, and with the language of operations research.))

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JOURNAL OF ACCOUNTANCY, *February, 1955; Pgs. 33-39.*

"Operational Accounting and Operations Research."

"Operational accounting" as a function of the new business science of operations research requires a redesign of accounting systems.

BUSINESS WEEK, *March 12, 1955; Pages 43, 44.*

"The Answer: Linear Programming."

Linear programming, a mathematical method of testing numerous courses of action, all dependent on each other, is becoming another tool of management.

Training, Seminars, Meetings

Wayne University Computation Laboratory – June 6 to July 2, 1955. Four special summer courses, one week each: 1) Electronic computers, business and engineering applications; 2) Automatic data processing; 3) Mathematical programming of management problems; 4) Numerical methods and advanced programming techniques. Write to: A. W. Jacobson, Director, Computation Laboratory, Wayne University, Detroit 1, Michigan.

University of Michigan course on computers–Aug. 1 through 12, 1955. Cost: $160.00 plus lodging. Write to: Dr. John W. Carr, Willow Run Research Center, University of Michigan, Ypsilanti, Michigan.

At least two groups have been formed to discuss business applications of electronic data processing. One group, limited to thirty members, is the "Business Electronics Round Table" in New York. Meetings are held once a month. The members have agreed that they will discuss freely and openly the work which is being done by them, with the understanding that it is not to be discussed outside the group. Attending the April meeting were Professor Charles W. Adams of MIT who is now on leave for a year to Westinghouse Electric, and Dr. Howard Aiken of the Harvard Computation Center. Each of these guests was asked to speak and answer questions of the members. Persons in New York Metropolitan area who are interested in joining or forming a similar group, should contact Harold Cauvet, care of General Foods Corporation, White Plains, N. Y.

A similar group has been formed in San Francisco and is named "Electronics Applications Research Forum." Harry Bergtholdt, California Packing Company, San Francisco, is the one to contact. Either Mr. Bergtholdt or Mr. Cauvet will furnish information to people in other cities interested in forming similar groups.

Linear Programming Course, presented from June 6 through July 1 by Methods Engineering Council, 718 Wallace Avenue, Pittsburgh 21, Pennsylvania.

Comment

GENERAL

There is a growing realization that preparation for using fully automatic data processing equipment is a long process requiring the time of top personnel. From the number of firms entering such a study phase, the benefits to be derived appear to be worth the effort. Often immediate benefits result when the long range study uncovers methods of improving present systems.

Company requirements must be studied before equipment can be chosen. This is partly a result of the fact that the equipment now available is very flexible and can perform nearly any data processing task. The time-consuming question is which equipment will pay off when applied to the particular application. Thus the details of the application and of available equipment must be determined and matched.

Perhaps the major problem (as mentioned this month) will be in obtaining personnel qualified to perform the system analysis and design.

APPLICATIONS

The Prudential (page 5) and Chesapeake and Ohio (page 5) discussions illustrate how two companies approach the analysis of requirements for data processing equipment. One company took an area already mechanized and applied the new techniques, choosing one that appears to pay off in direct cost savings. The other company decided to look at their entire problem, and spent some time in considering inter-divisional data flow and data required for company management before choosing one area to mechanize.

EQUIPMENT

Efficiently gathering data in mechanized form for insertion into an automatic system continues to be a problem which is quite different in different businesses. The most sophisticated technique for mechanizing data originating from outside the company (and therefore, of necessity, in language intelligible to humans) is to use a device which actually reads the numbers or letters and translates them into electronic coded form.

Although such devices are beset with technical difficulties, some units appear to be becoming available. The standardization of letter size and format among companies (e.g. a standard purchase-order form) would reduce technical problems.

MANAGEMENT DECISION

Many of the articles describing useful techniques to aid management in complex decision-making situations are written in technical language. DPD will try in these cases, to describe the article rather than abstract it. Stress will be laid on what the technique can do for management. Those who wish to make specific analyses of the mathematics are referred to the original articles.

One approach to utilizing science in management is to employ a qualified team (often a combination of scientists and company personnel) and allow them to approach the problems in whatever manner seems best. Often they may even be required to determine the problems first. Such an approach is described in the Warner-Swasey studies (page 10). Out of such studies have come and are coming specific techniques such as linear programming, waiting-line theory, and statistical models which can be applied to many other business problems. They can often be used to obtain results without lengthy studies. Technically qualified personnel are still required to some extent, of course.

Two applications of linear programming are mentioned this month indicating its general usefulness.

References noted in this issue

Advanced Management
74 Fifth Avenue
New York 11, New York

American Business
4660 Ravenswood
Chicago 40, Illinois

American Management Association
330 West 42nd Street
New York 36, New York

Automation
Penton Building
Cleveland 13, Ohio

Aviation Week
330 West 42nd Street
New York 36, N. Y.

Banking
12 East 36th Street
New York 16, New York

Best's Insurance News
75 Fulton Street
New York 38, New York

Business Week
330 West 42nd Street
New York 36, New York

Computers and Automation
36 West 11th Street
New York 11, New York

The Controller
1 East 42nd Street
New York 17, New York

Harvard Business Review
Soldiers Field Station
Boston 63, Massachusetts

Institute of Radio Engineers
1 East 79th Street
New York, New York

Journal of Accountancy
270 Madison Avenue
New York 16, New York

Management Science
Case Institute
Cleveland 6, Ohio

N.A.C.A. Bulletin
505 Park Avenue
New York 22, New York

The Office
270 Madison Avenue
New York 16, New York

Office Management
212 Fifth Avenue
New York 10, New York

Railway Age
30 Church Street
New York 7, New York

Stanford Research Institute
Stanford, California

Systems
315 Fourth Avenue
New York 10, New York

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New York, New York

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